contacting the palladium ions and a nucleic acid molecule under conditions effective to bind the palladium ions on one or more sites of the nucleic acid molecule; and

contacting the nucleic acid molecule having palladium ions bound to one or more of its sites with nickel or nickel alloy under conditions effective to deposit nickel or nickel alloy on the nucleic acid molecule.

2. (original) The method according to claim 1, wherein the nucleic acid molecule is selected from the group consisting of DNA, RNA, chemically modified nucleic acid molecules, and nucleic acid analogs.

3. (original) The method according to claim 1, wherein the palladium ions are in a solution comprising palladium acetate, acetone, and water.

4. (original) The method according to claim 1, wherein the palladium ions are in an aqueous solution of palladium chloride.

5. (original) The method according to claim 1, wherein said contacting the palladium ions and a nucleic acid molecule is carried out for about 1 second to about 1 hour.

6. (original) The method according to claim 1, wherein the nickel or nickel alloy is an electroless nickel plating solution.

7. (original) The method according to claim 1, wherein said contacting the nucleic acid molecule having palladium ions bound to one or more of its sites with nickel or nickel alloy is carried out for about 1 second to about 1 hour.

8. (original) The method according to claim 1 further comprising:

washing away excess palladium ions from the nucleic acid molecule prior to said contacting the nucleic acid molecule having palladium ions bound to one or more of its sites with nickel or nickel alloy.

9. (original) A method for detecting a target nucleic acid molecule in a sample comprising:

providing a device for detecting the presence of a target nucleic acid molecule in a sample comprising:

two electrical conductors, including a first electrical conductor and a second electrical conductor, wherein the electrical conductors are not in contact with one another and

one or more sets of two oligonucleotide probes attached to the electrical conductors, wherein the probes are positioned such that they cannot come into contact with one another and such that a target nucleic acid molecule, which has two sequences, a first sequence complementary to a first probe attached to the first electrical conductor and a second sequence complementary to a second probe attached to the second electrical conductor, can bind to both probes;

contacting the probes with a sample which may have the target nucleic acid molecule under selective hybridization conditions to permit target nucleic acid molecules, if any, present in the sample to hybridize to both of the probes and form a complex of the target nucleic acid molecule hybridized to the probes;

providing palladium ions;

contacting the palladium ions with the device after said contacting the probes with the sample under conditions effective to bind the palladium ions on one or more sites of any of the complex of the target nucleic acid molecules hybridized to the probes;

contacting the device with nickel or nickel alloy under conditions effective to deposit nickel or nickel alloy on the complex; and

determining if an electrical current can be carried between the probes, said electrical current between the probes indicating the presence of the target nucleic acid molecule in the sample.

10. (original) The method according to claim 9, wherein the target nucleic acid molecule is selected from the group consisting of DNA, RNA, chemically modified nucleic acid molecules, and nucleic acid analogs.

11. (original) The method according to claim 9, wherein the palladium ions are in a solution comprising palladium acetate, acetone, and water.

12. (original) The method according to claim 9, wherein the palladium ions are in an aqueous solution of palladium chloride.

13. (original) The method according to claim 9, wherein the sample is saliva, whole blood, peripheral blood lymphocytes, skin, hair, or semen.

14. (original) The method according to claim 9, wherein said method is used to detect infectious agents.

15. (original) The method according to claim 9, wherein said method is used for nucleic acid sequencing.

16. (original) The method according to claim 9, wherein said contacting the palladium ions and the device is carried out for about 1 second to about 1 hour.

17. (original) The method according to claim 9, wherein the nickel or nickel alloy is in an electroless nickel plating solution.

18. (original) The method according to claim 9, wherein said contacting the device with nickel is carried out for about 1 second to about 1 hour.

19. (original) The method according to claim 9 further comprising:

washing away excess palladium ions from the complex prior to said contacting the device with nickel or nickel alloy.

20. (original) The method according to claim 9, wherein the probes are complementary to sequences from the genetic material of a pathogenic bacteria.

21. (original) The method according to claim 20, wherein the pathogenic bacteria is a biowarfare agent.

22. (original) The method according to claim 20, wherein the pathogenic bacteria is a food borne pathogen.

23. (original) The method according to claim 9, wherein the probes are complementary to sequences from the genetic material of a virus.

24. (original) The method according to claim 9, wherein the probes are complementary to sequences from the genetic material of a human.

25. (original) The method according to claim 9, wherein one or both of the probes has a sequence which is complementary to a sequence having a polymorphism, wherein the base or bases complementary to the polymorphism are located at an end of the probe distal to the conductors.

26. (original) A method for metallizing one or more sites of a nucleic acid molecule comprising:

providing stannous ions;

contacting the stannous ions and a nucleic acid molecule under conditions effective to bind stannous ions on one or more sites of the nucleic acid molecule; and

contacting the nucleic acid molecule having stannous ions bound to one or more of its sites with silver under conditions effective to deposit silver on the nucleic acid molecule.

27. (original) A method for detecting a target nucleic acid molecule in a sample comprising:

providing a device for detecting the presence of a target nucleic acid molecule in a sample comprising:

two electrical conductors, including a first electrical conductor and a second electrical conductor, wherein the electrical conductors are not in contact with one another and

one or more sets of two oligonucleotide probes attached to the electrical conductors, wherein the probes are positioned such that they cannot come into contact with one another and such that a target nucleic acid molecule, which has two sequences, a first sequence complementary to a first probe attached to the first electrical

conductor and a second sequence complementary to a second probe attached to the second electrical conductor, can bind to both probes;

contacting the probes with a sample which may have the target nucleic acid molecule under selective hybridization conditions to permit target nucleic acid molecules, if any, present in the sample to hybridize to both of the probes and form a complex of the target nucleic acid molecule hybridized to the probes;

providing stannous ions;

contacting the stannous ions with the device after said contacting the probes with the sample under conditions effective to bind the stannous ions on one or more sites of any of the complex of the target nucleic acid molecules hybridized to the probes;

contacting the device with silver under conditions effective to deposit silver on the complex of the nucleic acid molecules hybridized to the probes; and

determining if an electrical current can be carried between the probes, said electrical current between the probes indicating the presence of the target nucleic acid molecule in the sample.

28-31. (withdrawn)

32. (original) A method for detecting a target nucleic acid molecule in a sample comprising:

providing a device for detecting the presence of a target nucleic acid molecule in a sample comprising:

two electrical conductors, including a first electrical conductor and a second electrical conductor, wherein the electrical conductors are not in contact with one another and

one or more sets of two oligonucleotide probes attached to the electrical conductors, wherein the probes are positioned such that they cannot come into contact with one another and such that a target nucleic acid molecule, which has two sequences, a first sequence complementary to a first probe attached to the first electrical conductor and a second sequence complementary to a second probe attached to the second electrical conductor, can bind to both probes;

contacting the probes with a sample which may have the target nucleic acid molecule under selective hybridization conditions to permit target nucleic acid molecules, if

any, present in the sample to hybridize to both of the probes and form a complex of the target nucleic acid molecule hybridized to the probes;

attaching to the probes and any target nucleic acid molecule metal ions; and

determining the presence of the target nucleic acid molecule in the sample by detecting the scatter of light caused by the metal ions attached to the probes and any target nucleic acid molecule.